

SWINE IN DENMARK, SWEDEN, NETHERLANDS, FRANCE
AND ENGLAND

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Foreward

The Producers Swine Improvement Association made a grant to a committee to study swine production and marketing practices in Denmark, Sweden, Netherlands, France and England. Members of the committee were Mr. F. G. Ketner, General Manager and Secretary, Producers Livestock Association, Columbus, Ohio, Dr. C. B. Cox, Agricultural Economics Department, Purdue University, Lafayette, Indiana and Mr. W. H. Bruner, Extension Specialist, Animal Science and Marketing, Ohio State University, Columbus, Ohio.

The study was made during the period of June 29 and August 2, 1957.

Schedule arrangements for the study were handled through the Foreign Agricultural Service, USDA, working with the Agricultural Attache of the American Embassy Offices and leaders of farm organizations.

Information presented in this report was obtained by:

1. Observing swine production practices on farms
2. Observing progeny testing programs in operation
3. Studying bacon and meat canning factory operations
4. Interviewing leaders of farm organizations
5. Observing meat marketing operations (wholesale and retail)
6. Studying agricultural published materials of the various countries and
7. Attending FAO/FEZ Pig Progeny Testing Meeting at Copenhagen.

Members of several Ohio swine groups provided W. H. Bruner with financial assistance for photography equipment and supplies. Over 250 colored 2" x 2" pictures were taken during the study.

Swine in Denmark, Sweden, Netherlands, France and England

General Information about Denmark's Agriculture

The soil is virtually Denmark's only raw material and its principal asset is its people. The soil is not particularly fertile but Denmark is one of the largest exporters of livestock products. Agricultural products account for about two-thirds of all Danish exports while agricultural workers and their families are only about 20 percent of the total population (4,400,000). The farmers realize the necessity of having a uniform high quality product and work together to get it.

Most of the farms are owner operated and are relatively small. There are about 212,000 farms in Denmark with about 49 percent being less than 25 acres. This group has 17 percent of the land. About 39 percent of the farms are from 25 to 75 acres and account for 46 percent of the land. Another 10 percent of the farms are from 75 to 150 acres and account for 24 percent of the cultivated land. Less than 2 percent of the farms are over 150 acres but account for about 13 percent of the land.

About 85 percent of the agricultural land is under ordinary crop rotation. Cereals (wheat, rye, barley, oats, etc.) account for 42 percent; root crops (beets for fodder and potatoes) 18 percent; rotational grasses and green fodder crops 21 percent; and special sales crops like seed and horticultural produce 4 percent. Only 15 percent is under permanent pasture and most of this is on land unsuitable for crop rotation.

Denmark exported about 830 million dollars worth of products last year. Twenty-five percent of this was from products made from bacon pigs or sows, 25 percent from butter and about 8 percent from eggs.

The Meat Processing Industry

During the past year the farmers of Denmark produced about 7 million hogs for sale. These were slaughtered by 78 plants called "Bacon Factories." Sixty-two of these are cooperatives that slaughter 88 percent of the hogs. The other 16 are private (not Danish cooperatives) doing 10 percent. The other 2 percent is slaughtered by butchers. The bacon factories do primarily slaughter and curing of sides (bacon) for export to Great Britain. However, some of them also do canning and other processing. The carcasses not cured or cuts not processed are sold by them direct to canners or through the wholesale market. There are three cooperative canning factories owned by the cooperative bacon factories that buy part of the carcasses and cuts sold by them. Most of the canning, however, is done by private companies.

At the wholesale market in Copenhagen, 30 commission firms (one cooperative) operate to sell products from the Bacon Factories. The pork products here are primarily whole carcasses (both suitable for export - Lurbrand - and not suitable) and bellies. The sale here are to butchers, processors (sausage and curing) and canners. All meat being sold is hung in a non-refrigerated area for display unless it is being held over for the next day. Then it is refrigerated.

On the average about two-thirds of the pork is exported either as bacon or canned and one-third is consumed domestically.

Pricing of Pigs in Denmark

The pricing and marketing of hogs in Denmark is different from the States. The hogs go direct to the slaughtering plants without passing

through any central or assembly market. Also the hogs are priced on carcass weight and quality rather than live weight.

Since export plays such a large part, export prices affect domestic prices very much. Also, since 88 percent of the hogs are slaughtered in cooperative plants, cooperative policy plays an important part. In order for the farmer to make a decision on the exact date, a system of forward pricing is followed by the cooperatives.

On Thursday of most weeks, the price committee of the Federation of Cooperative Bacon Factories meets and sets the price that all cooperative slaughtering plants will pay for hog carcasses during the following week. The private plants of course are affected by this set price and must pay the same or slightly higher to get any hogs for slaughter. The reason the private must be higher is farmers take the refund into consideration when selling. Now some of the private have started paying refunds at the end of the year in order to compete.

The farmer is supposed to bring the hogs in at 198-210 lbs. (90-95kg). However, plants say that if farmers read something about the bacon market in England, they may rush the hogs in or delay for a few days.

Each farmer (member) is given a number at the plant. Before the farmer ships the hogs, he stamps this number on the ham of each one. (The number is similar to a tatoo but no ink is used). When the hogs are slaughtered, the carcasses are weighed individually as they pass down the line and then graded. The farmer is paid on the basis of weight and grade of carcass.

The weighing and grading are done by employers of the plant and not by government or a third party. The farmers do not come to the plant to

watch the weighing or grading since it is their organization. The hauling is done by commercial truckers.

In addition to setting of prices for hogs, some group pricing is done through the marketing channel. The Danish Bacon Factories Export Association composed of both cooperative and private companies established export prices to the various countries on bacon pigs and sows, lard and canned meat. In fact all canned hams going to the states are sold for the same price (82 cents per lb.) regardless of the canner.

Pricing in the wholesale market is also done mostly by a committee. For example in the Copenhagen market, three times each week three representatives of the 30 commission firms and 3 representatives of the buyers meet and establish prices. Here, however, prices may go lower if supplies get heavy.

Organization and Services of the Slaughtering Associations

The hog slaughtering plants are well organized into the cooperatives and private associations. These two work together on some problems and services but separately on others. Some of the services discussed here will be covered in greater detail elsewhere in the report.

Joint Services offered or performed together.

I. Planning

- A. Jointly they negotiate with government ministries and authorities on problems concerning hog and pork products industry.
- B. Testing committee, control committee and Bacon inspection set standards for products and then make tests to see if standards are being maintained. Three testers with government appointments make unannounced visits to check on quality control. Samples are taken and sent to the laboratory where tests are made by college trained personnel.

C. Bacon Factory School and Bacon Factory Experimental Laboratory.

A Research Institute has been set up with Marshall Funds but expenses paid by factories for work on operating problems primarily on products. Samples of brine, water, etc. are sent in for tests. Working now on "White Muscle Disease." Schools are held for bacon factory employees from 1 day to 3 months in length. Schools are held for slaughterers, bookkeepers, foremen of slaughter plants and canning plants as well as for special products people.

In addition to the Institute a laboratory has been operating in Copenhagen since 1930 for the canning industry to specifically test canned products and maintain strict quality control.

II. Employers Federation

Jointly the private and cooperatives bargain with the 10,000 workers in the 98 factory plants. This is done with the different unions such as Factory Workers, Engineers, Works Superintendents and Clerks. Labor troubles at the individual plants are referred to the central committee.

III. Bacon and Allied Factories Purchase Association

The Purchasing Association buys wholesale and sometimes contracts for the production of some equipment and articles for the bacon factories, canning and sausage factories, albumen factories, lard refineries, meal extract factories and by-products and chemical plants. Last year this association did $4 \frac{1}{3}$ million dollars in volume, paid 5 percent on stock, gave $2 \frac{1}{2}$ percent of sales refund in cash and retained 2 percent in the business.

IV. The Danish Bacon Factories Export Association

This association controls the export of pork and pork products. Some of the testing committees discovered earlier are actually under this association. Quality, quantity and price are attempted to be controlled by this association. This organization held 10,000 carcasses off the export market the week we were there to support the market. Hams, shoulders and loins were sold to canning factories, sides were sold back to farmers at reduced prices. At the present time, the association thinks 6 million hogs would be much better than the present 7 million being produced this year. Efforts to cut back

production have been attempted by securing a restriction on imports on bread grains and setting higher prices for sows for export.

Services Offered By the Cooperative Association

Without the Aid of the Private Slaughterers

I. Central Committee for Pig Breeding

The cooperatives own three pig testing stations and with a committee controls the 267 breeding stations. This is discussed in detail elsewhere in the report.

II. Insurance Department

The cooperatives offer maritime, war, fire and accident insurance. These have been very profitable. The insurance company has had money to lend, but it may be borrowed by the cooperatives.

III. The Price Committee

The price committee is made up of six directors - 4 managers from bacon factories and 2 farmer members. Its work is also discussed elsewhere.

Operations of Cooperatives in Denmark

Cooperatives play an important part in Danish economic life especially in those areas involving trade with other countries. In fact the country has often been referred to as "Cooperative Denmark".

Contrary to the belief of some people in the U. S. the Danish Government has neither supported nor hampered farm cooperatives nor has it done much to regulate their activities and development. Denmark has no law concerning cooperative societies, not even a public registration of them. The state does not protect nor subsidize them. The only legislation which has any bearing on cooperatives is a special tax which was revised in 1949

with the purpose of equalizing taxes of cooperatives and private firms.

Because of the importance of the products handled cooperatives do influence government policy. The cooperative association in bacon and dairy are very powerful since pork and butter account for 50 percent of Denmark's exports.

In 1954 cooperatives handled 91% of the milk, 65% of the Danish butter export, 90% of the pig slaughter for export, 42% of the meat and cattle export, 36% of egg export, 53% of the total consumption of feeding stuffs, 45% of the seeds used and 12% of the total retail trade (consumer societies). In 1954, all cooperatives including insurance did about 1.2 billion dollars in business.

With the exception of urban cooperatives, the cooperatives are federated into a central cooperative committee that works on broad problems but does little educational work. The principal work is done by the commodity cooperatives.

The basic organization of the cooperatives is the same as in the United States - members, board of directors, manager and employees. However, it is not uncommon for one manager to be manager of two cooperatives with separate boards of directors. This may occur in two retail fields with members wanting the cooperatives separate - one to keep from subsidizing the other.

The trend is for specialization - one cooperative for one service - but some cooperatives do perform or handle several lines.

In general the cooperatives are following the basic cooperative principles.

1. Control in the hands of patrons - all have 1 member 1 vote. Some do allow wife or elder son to vote for farmer if he is absent, but no proxy as we know it.

2. Ownership in the hands of patrons. Here some are operating on borrowed money with guarantees by members instead of member money. However, the Central Cooperative Committee is now recommending a revolving method of financing.
3. Limited return on capital - Most of them pay a dividend on capital retained of members.
4. Operate at cost. Some are using a revolving plan, some pay back entire savings operating on borrowed funds while others do a combination of cash and retained savings.

In addition to the Agricultural Cooperatives, there are many urban cooperatives that do a large share of the total business. There are 52 urban retail societies, 40 cooperative bakeries, 43 canteens, 267 housing, 18 fuel, 73 building and contracting and 39 product societies.

Cooperative Slaughtering Plants

Visits were made to the cooperative slaughtering plants at Roskelde and Odense. Statements are made based on those two plants, conferences with association personnel and writings about bacon factories.

Each cooperative slaughtering plant has a number of members that agree to sell all pigs produced to them when they are between 198-210 pounds. Some plants have from 10,000 to 12,000 members. We were told that members actually had contracts from 5-20 years for these sales. In actual practices, however, the plants do not try to enforce the contract or agreement. One manager stated that the farmer may be a member of his plant while the wife Then the plant giving the highest refund got the hogs. a member of another./ (All pay the same price at the start).

Most plants have regular truckers that haul pigs to the plants. They charge from 30 to 40 cents per hog for hauling. The plants receive hogs all during the day up until a certain hour and then they try to slaughter all that were received. Even though the seasonal variation in hog receipts

is low, the daily receipts fluctuate widely. The plant never knows the day the farmer will send them in. This causes some overtime of workers.

The different methods were used to stun hogs before being stuck. One plant used an electrical stunner which was a two tined fork placed behind the ears and the other used carbon dioxide tanks. Before scalding, the mouths were stopped with wooden pegs to prevent the lungs from being filled with water.

Following scalding the passing through the dehairing machine, hogs are put for about 15 seconds in a singeing furnace that is gas fired and really hot. The pigs come out brown and then are mechanically and hand scraped (all movement after the singe and mechanical scraper is by hand). The intestines are removed, inspected, weighed, back bones removed, graded and sent to cooler. Carcasses meeting the most rigid requirements may be branded with a hot Danish rolled brand and stamped with "Lurbrand".

In doing the trimming for English bacon, carcasses are placed on tables where workers come past and do special jobs. The aitch bone is removed, the excess fat, trim and diaphragm, the shoulder blade bone disjointed, then a hand operated machine is used to pull the blade bone, the chin bone removed and ribs trimmed. The "bacon" is then ready for cure.

The English bacon is first stitch pumped and placed in brine for 4 days, removed for draining 4 days before being wrapped four to the bundle for shipping to England.

The "bacon" is not smoked in Denmark, but dry smoked in England.

The slaughtering plants do not put all carcasses into "bacon". Some carcasses are sold in the domestic market, some cut with hams, shoulders, etc. going to canning plants and bellies going to market. Also, some of

the slaughtering plants also do canning, curing and processing.

The plant at Odense kills 6000 hogs per week at a rate of 220 per hour, from 70-80 workers are on the killing line. They stated this was the largest slaughtering plant in Denmark.

At Roskilde, 3000 are killed per week at a rate of 240 per hour with 50 workers on the kill line. These workers do the cleaning and work on cutting. They slaughter three days per week. Seventy-five percent of the carcasses are sold as "bacon".

Then some plants kill cattle, calves, sheep and horses - not many horses.

Roskilde plant was making lard with onions in it for use instead of butter. It is about the same price as oleo.

Meat Canning Factories in Denmark

Visits were made to two canning plants in addition to seeing canning done by the slaughtering plants. One of these was "Plumrose" a private canning company which is also the largest processor in Denmark. This plant was relatively efficient in comparison. The other was D. A. K. a cooperative canning plant owned by 22 of the "bacon" factories set up specifically for canning. The D. A. K. also operates a pharmaceutical plant. These are two other cooperative canning plants but each operates independently in buying and selling.

These canning plants do not slaughter. They buy from the slaughtering plants or from the wholesale market - but primarily from the slaughtering plants. Meat from the wholesale market costs more because of charges for passing through the market as well as not as fresh. The plants buy hams, shoulders and some carcasses. The private firm buys mostly by telephone

while the cooperative announces each Sunday the price it will pay during the coming week.

The wage scale in the canning plants was about \$30.00 per week base plus a bonus of \$3 to \$5 for certain work. It should be pointed out that this money (200 k) will probably buy more than \$30.00 in the States. Women are paid about 65% as much as men. They had 400 employees in the plant.

The Plumrose plant was processing about 13,000 hams, 8,000 shoulders and 4,000 loins per week in addition to other cuts of pork. They also used 23 tons of boneless beef that week. Their total production for the week was 270 tons or 533,000 cans. Hams last week graded 53% No.1, 35% No. 2 and 10% No. 3.

Last week they purchased products from 27 different companies and normally export to 120 different countries through the year. England is their biggest customer with the United States next.

The D. A. K. could handle from 10-15,000 hams and shoulders per week with a total tonnage of 100-125 tons. They have 200-250 workers in the plant. About 10-15 percent of bacon factories output can be handled by the Cooperative Canning Plant.

D. A. K. was started in 1935 with funds retained by bacon factories from farmers at 15 cents per pig from 1932. They invested about \$171,000 (1.2 m.k.) in the plant while today they have \$364,000 (2.5 million kroner). It made no profit during the past two years. It is controlled by the bacon factories and the Association. Each factory has 3 votes and the Association has 3 votes. They have 11 directors - 2 from the Association and 9 from factories. The directors have 2-year terms. Their annual meeting lasts for 3 days. In the past 20 years they have returned 1.4 million dollars to the bacon factories.

The canning factories behind it performed a service in setting standards and assisting in price making in addition to money returns.

In the plants, much more labor is used than in the States. All fat is taken off by hand. Meat going into stuffing machines is put in with hands instead of a spade. Meat to be ground is put in large buckets. Equipment used is mostly from the States, but is very expensive to them.

In canning hams, regular hams are used for the 1# and 2# cans rather than large ones. Ham that does not meet specification may be put in "picnic" cans. Shoulders and picnics are labeled as such rather than picnic hams.

Meat products being shipped to the States contain a higher percentage of meat than if going to England or other countries.

Pork skins are ground and added to canned products such as patted meat.

Pig Breeding Centers and Testing Stations in Denmark

I. History

Denmark depended on exports of live pigs to Germany prior to 1885. Germany placed embargo on live pigs in 1887 and this resulted in developing British market for bacon.

II. Pig Breeding Centers

Large white boars imported from England were first crossed on Danish Landrace sows to improve carcass value. This was done prior to 1895. Breeding centers were established for both pure Landrace and large whites to provide commercial producers with gilts. Boars from these centers are bought by bacon factories and made available

to farmers. Through these government approved pedigree pig breeding centers cooperating with bacon factories and research scientists, improvement has been made in production and quality. These approved breeding centers are farmers who have taken a special interest in pig breeding. They are subject to inspection by the Central Committee for Pig breeding and by an advisor in pig breeding who cooperates with the local pig breeding committees. By 1938 the number of Landrace centers had increased to 250 and today the number is 265. Since 1933 the number of Large White centers (33) has declined until today only two survive.

Animals at the breeding centers are judged according to:

	<u>Maximum Points</u>
1. Management and general appearance of herd	48
2. Conformation of breeding animals	40
3. Fertility of breeding animals	24
4. Feed efficiency	24
5. Carcass quality	32
Total	<u>168</u>

Scores for feed efficiency and carcass quality are based on results from testing stations. A veterinary inspection is made twice a year and all animals over 8 months of age must pass the T. B. test.

The owner must discard from his herd all animals found unsuitable by the committee or by the Veterinarian inspection.

Breeding centers are supervised by a central committee for pig breeding and approved by the Minister of Agriculture and are under obligation to submit to one of the testing stations four litter mates (2 males and 2 females of every approved boar and sow). The central committee supervises nine districts.

III. Testing Stations

In 1907 the first pig progeny testing station was started. Work expanded to five stations by 1926. In 1950 these five stations were replaced by three new identical stations constructed for individual uniform feeding of all pigs on test. Money for building these stations came from the sale of bacon enroute from Denmark to England, when World War II was declared. This bacon placed under embargo while enroute was shipped to England by a cooperative bacon factory. During the War this factory was forced out of business. After the War the money from the sale of this bacon was turned over to the Institute of Slaughterers and in turn was used to build the three new testing stations in 1950.

These stations were established by the Federation of Danish Cooperative Bacon Factories with government approval.

Pigs are started on test at approximately 44 pounds and go to slaughter at approximately 200 pounds. Pigs are limited, hand fed three times a day a ration of milk, barley, potatoes and hops. The temperature of the testing stations is controlled at approximately 14° C. (57.2° F.). Each station has a capacity of 400 pigs. Approximately 1200 pigs are tested annually at each station. Farmers are paid market value for pigs when delivered to the station. The in freight to the station is also paid for pigs delivered to the stations by the centers.

Any profits or losses derived from operation of the stations are handled by the bacon factories.

As test pigs reach 200 pounds in weight they are slaughtered

at one of the cooperative bacon factories. The cooperative bacon factories pay for the required advisory supervision.

Pig testing stations are under general direction of R. N. Thomsen, Research Officer of the National Research Institute of Animal Husbandry. The man in charge of each station is known as an Assistant Leader. Mr. Madsen is in charge of the Roskilde Station. Two or three laborers are required at each station.

IV. Results:

Data is published on all pigs as to performance and ownership.

Results of testing stations are used for selection to improve herds of breeding centers.

During the time stations have been in operation the rate of gain has improved approximately 20% and feed conversion reduced correspondingly.

No progress made in carcass quality until 1926-27. Since then quality of Landrace has improved steadily.

Length of body, thickness of backfat and thickness of streak are measurements used to determine quality.

High degree of uniformity has been obtained for all three factors, however, least for body length and most for backfat thickness.

Year	Length of Body		Av. Back Fat Thickness		Thickness of Streak	
	C. M.	X In.	C. M.	In.	C. M.	In.
1926-27	88.9	35.03	4.05	1.596	3.06	1.204
1955-56	94.1	37.08	3.21	1.265	3.32	1.308

X measured from pubic bone to atlas joint.

Carcasses are also scored on the following points: shoulders, hams, fullness of meat and bacon type.

Since 1954 size and shape of loin eye has been studied as it appears from a cut just behind the last rib.

Loin eye muscle measurement corresponds very well to the development of muscle in general.

560 loin measurements averaged 38.7 C. M.², range 28.5 to 54.0 C. M.².

Correlation coefficient of .75 between score points (shoulder, ham: fulness of meat and bacon) and loin surface area in proportion to the cover of fat.

Color of meat has been estimated since 1954. 12% of pigs from testing stations have shown very pale meat. Breeders are urged to consider color of meat in selection of breeding stock.

Results of testing stations are used for selection to improve breeding center herds.

9,000 boars produced annually by pig testing stations and sold to farmers through cooperative bacon factories.

8,000 sows per year sold direct to farmers from breeding stations.

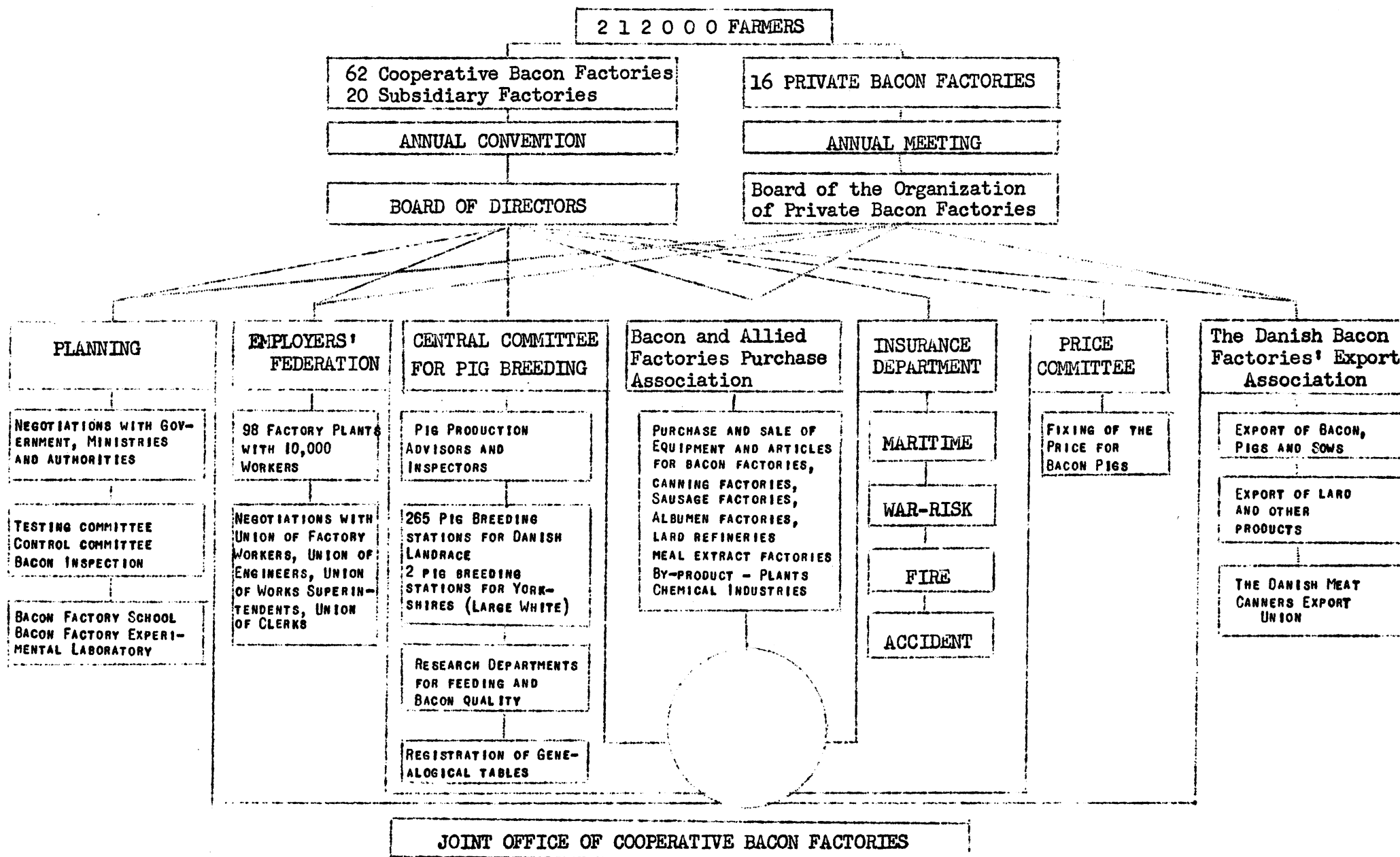
Pigs produced commercially from boars from breeding centers have improved since 1938. In 1957 graded 70% compared to 50% in 1938.

The pig breeding system practiced in Denmark has proved effective in improving production and carcass value of the commercial pig crop.

Over the years the pig breeding program has been extended to include herds of pigs not up to standards required for a breeding station. To help these breeders to improve their herds, smaller local testing stations have been established and are operated by local cooperative bacon factories and Farmers' Societies. At present 16 such stations are in operation. Many local breeders are able to improve their herds to such an extent that they can later be recognized as breeding centers.

The ideal carcasses today carry less than 3 C. M. backfat thickness (1.182 inches). The lowest possible backfat thickness seems to be about 2.1 to 2.2 C. M. (.827 to .867 inches.)

PLAN OF ORGANIZATION



FAO/FEZ Meeting on Pig Progeny Testing

Copenhagen, July 8 - 13, 1957

Countries with official attendance: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Norway, Sweden, Switzerland and United Kingdom.

Professor J. L. Lush of State College, Iowa, Dr. Clifton Cox, Purdue University, Indiana, Mr. F. G. Ketner and Professor W. H. Bruner of Ohio were also in attendance. The latter three were invited to attend the conference by FAO/EAAP through the American Embassy in Denmark.

Papers presented during conference included:

1. Pig Breeding and Progeny Testing in Denmark.
2. Pig Breeding and Environment - France.
3. Accomplishment of Progeny Testing.
 - a. Feeding and Management (England)
 - b. Growth and Efficiency of Feed Conversion (Germany)
 - c. Progeny Testing in Relation to Market Requirements (Netherlands).
 - d. Estimation of Carcass Quality (Sweden).
4. New Methods of Estimation of Carcass Quality on live pigs (France).
5. Utilization of Progeny Testing Results in Practical Pig Breeding (Austria).
6. The Possibility of Standardization of Pig Progeny Testing in Western Europe (Denmark).

Highlights of Conference

1. 67 pig progeny testing stations in Western Europe with annual capacity of 30,000 - 36,000 pigs.
2. Plans have been developed for 9 new stations.
3. In several countries progeny tests have become an important

factor in pig breeding.

4. Importance of standardization of methods if results are to be compared within breeds and countries.

a. Possibility of cooperating countries being divided into two groups.

1. Finland, Sweden, Norway, Denmark, Great Britain, Germany and Switzerland which are now using similar methods of evaluating carcass quality by measurements and scoring system.

2. Holland, Belgium, France, Italy, Portugal and Spain attach great importance to cutting up carcass even though measurements are also taken.

5. Existing differences in management methods do not appear to be of decisive importance in developing a standardization of testing.

Suggested Program for Standardization

1. A special committee should be set up within the Study Commission of Pig Production of the European Association for Animal Production, possibly in collaboration with F. A. O.

2. All countries which carry out pig progeny tests can participate in the program.

3. The Commission appoint a paid secretary.

4. The participating countries pay a subscription to the Commission to cover necessary expenses.

The above suggested program for standardization was considered at last session of conference. No report available at present time as to recommendation on standardization.

Swedish Agriculture with Particular Reference to Pigs

Although Sweden lies in the same latitudes as Alaska and Southern Greenland, farming is highly developed. The warm waters of the Gulf Stream tend to moderate the climate. The country is approximately 1000 miles (north to south). The northern portion of the country is ideal for forestry while the plains of central and southern Sweden are ideal for agriculture.

One tenth of land area consists of arable land and permanent pasture, the remainder in forest and mountainous country. 9.2 million acres of arable land and 1 million hectares of permanent pastures produces enough foodstuffs for the 7 million population and sizeable exports of butter, cheese, eggs, oil seed and some pork.

Agriculture imports consist of fertilizer, machinery, fuel oil and roughage for livestock feed.

High production of plant and animal agriculture is the result of plant improvement and selective breeding.

Swedish farms are mostly small holdings with an average of 22.5 acres. 275,000 farms below 30 hectares. 320,000 total farms in Sweden.

25% of crop production goes for direct food consumption (bread, sugar, etc.) and 75% for livestock feed.

Of Sweden's 41 million hectares 57% consists of productive forest land. Forest products (wood, paper pulp, etc.) are Sweden's principal exports representing 40 - 50% of total export value. 25% of forests is public ownership, 25% timber companies and 50% by farmers.

Industry started rather late in the development of Sweden. As late as 1875 seventy five percent of the working population were employed in

agriculture and only 15% in industry and 6% in service occupations. Today it is estimated only 20% of working population engaged in farming while industry has 43% and service 26%.

Swedish agricultural population reached its greatest number in 1880 with a total slightly over 3 million. Now it is down to less than half and is still decreasing about 40,000 per year of whom 20,000 are in the working age.

The typical farm is a small family holding with few large estates. Bulk of work done by the farmer and his family. 37.5 acres of arable land are considered necessary for a family to make a satisfactory livelihood. Only one fifth of the small farms fulfill this condition, therefore, income is supplemented by forestry and industry.

\$210 million income annually from sale of pork, which is 65% of total meat sales.

The two breeds of pigs are Swedish Landrace and Swedish Large Whites. Breeding is concentrated in approximately 200 breeding centers of which 70% consists of Landrace. Official herd book started in 1911.

Only breeding centers are permitted to breed and sell boars and registered females within the country or for export. 75% Landrace and 25% Large Whites.

There are three kinds of pig farms:

1. Piglet producers (hatcheries) (Approximately 50,000 farms).
2. Breeding centers (180 farms).
3. Fattening farms (50,000 farms).

Strict health control program through cooperation of Veterinary Institute, Agricultural Societies of Pig Breeding Association. Only breed-

ing centers with herd health certificates (issued by Veterinarian Inspector) are permitted to sell animals for breeding purposes. Certificate herd is free from virus pneumonia, rhinitis and general health of herd is good.

Veterinarian Inspector visits breeding center twice each year. Clinical examination is made for virus pneumonia and rhinitis.

Farmers wanting to put herd under breeder center plan must have herd inspected 6 months in advance before certificate can be issued.

Should virus pneumonia or atrophic rhinitis be found in breeding center, breeder is not allowed to sell breeding animals until the herd is clean again.

The health control program for young pig producing farms is an important factor in Sweden's Swine program. This has reduced mortality of suckling pigs. Approved piglet farms receive a premium of 60 cents for young pigs sold. This tends to assure the buyer of feeder pigs freedom of infectious diseases.

Litter Recording:

1. Size of individual pigs and litter weight checked at birth and 3 weeks of age.
2. Records kept by official of local Agricultural Society.
3. Records published in Society Journals and Herd Book if sow is registered.
4. Royal Board of Agriculture publishes the Herd Book.
5. Government Advisor and Agricultural Livestock Advisor score breeding animals as to conformation and recommend line of breeding to be followed.
6. Sows to be eligible for Herd Book must have at least 12 sound udder sections and produced at least two litters of 8 pigs each with litter weight of 84 lbs. at 3 weeks of age.

Pig Progeny Testing (started in 1923)

1. Basis of determining breeding value as to quality of progeny.
2. Five testing stations in operation.
3. Cooperators are: Royal Board of Agriculture (highest authority), Agricultural Societies, State Animal Experiment Station, State Institute of Veterinary Medicine and Pig Breeding Centers.
4. Four pigs per litter sent to testing station (2 of each sex) at 8 to 10 weeks of age. Started on test at 44 lbs. (av. weight) and test continues until individual animals weigh at least 194 pounds.
5. Testing factors or conditions:
 - a. Temperature controlled as nearly as to 63.3° F.
Sometimes summer temperature gets up to 68.3° F.
 - b. Pigs fed twice a day during week and once on Sunday
(Amount of feed determined by 20 minute clean up)
 - c. Farmers paid 80% of value of pigs delivered to station.
 - d. Carcasses are judged as to length, thickness of belly, thickness of back fat and quality of hams after 24 hours in cold storage.
 - e. Results of testing station are sent to Royal Board of Agriculture.
 - f. At least 5 sows and 1 boar must be maintained in herd to participate in pig progeny testing. Herd must be approved and participated in litter recording for at least one year and verified by health certificate.

g. In order to be listed in the Herd Book as progeny tested the following requirements must be fulfilled.

1. Sire and Dam must be registered in Herd Book.
2. At least 12 normal teats.
3. At least three groups (4 pigs per litter) out of different dams by same boar must have reached the following mean results.
 - a. Age - Maximum 200 days - 194 lbs. - after January, 1958 - 190 days.
 - b. Length of carcass - 36.2" - after January, 1958, 36.6" (measured from pubic bone to atlas bone).
 - c. Average fat back - minimum .7" maximum 1.5" - after January, 1958 .7" and 1.34" respectively (5 measurements.)

Results of Litter Recordings

Breed	Year	Number of			Number of Pigs		Weight of Pigs at 3 Wks.		Percent Dead at 3 weeks
		Herds	Sows	Litters	At Birth	3 Wks.	Total	Per Pig	
Landrace	28-29	33	323	541	10.3	8.1	43.9	5.4	22
Landrace	53-54	139	1138	2229	11.0	9.1	54.7	6.0	18
Large Whites	28-29	152	1067	1756	11.0	8.8	45.1	5.1	20
Large Whites	53-54	52	540	1092	10.8	9.2	54.5	5.9	16

Results of Progeny Testing

Breed	Year	No. of Pigs	Daily Feed 1/		Thick- ness Back Fat	M. M. Belly	Length of body Cms.	Points for Classification					
			Gr.	Per Kilo Grain				2/		% of Carcasses			
								Belly	Ham	IT	I	II	III
Landrace	1923	29	626	3.71	43.0	32.5	92.0	11.5	11.6		37.9	27.6	34.5
Landrace	1955	2237	690	3.08	32.3	34.7	94.2	12.7	12.7	12	76.	11.0	1.0
Large Whites	1923	17	620	3.79	41.0	33.5	92.0	12.1	12.3		41.2	29.4	29.4
Large Whites	1955	641	699	3.05	32.7	33.8	94.0	12.7	12.2	15	73.	11.0	1.0

1/ Feed unit = Nutritive value of 1 Kg. (2.2#) barley

2/ 1953 - Classification groups changed from I, II, III to IT, I, II, III. (IT extra thin)

The Swedish Farmers' Cooperative Organizations

The Federation of Swedish Farmers' Associations acts as the central body for all the cooperative organizations and it, along with the Farmers Union, represents Swedish farming in general. Virtually all farmers who sell their produce - approximately 300,000 - are affiliated with farmers cooperative associations. Between 80 and 90 percent of the agricultural produce is marketed by the farmers' cooperative societies. This marketing in many instances involves processing the produce as well and may also mean distribution to retailers and/or consumers. The cooperatives in Sweden are much more integrated than in the United States.

The Federation (SL) is made up of 12 national organizations. These 12 are: Dairy Association, Meat Marketing Association (SS), Selling and Purchasing Association, Egg Marketing, Forest Owners' Societies, Rural Credit Societies, Royal Mortgage Bank, Distillers' Association, Fur Breeders, Starch Producers, Flax and Hemp Growers, and Oil Plant Growers Associations. The Federation also has 27 cooperative councils for local contract and cooperation with the Federation.

The National Cooperative Organizations such as Meat Marketing have local organizations (societies) also that work in specific areas of the country.

The purpose of the Federation is to promote the interest of members and farmers to represent agriculture in matters of general importance, to carry out assignments of common interest to affiliated organizations and to work closely with the Farmers Union. The Federation negotiates with authorities and with industrial and commercial organizations.

The Federation has a General Assembly of 200 representatives elected by the member organizations. It has a Board of Directors made up of one from each member organization and 9 appointed by the Assembly.

The member organizations and associations pay dues to the federation based on their annual volume of business. In addition the National Organizations pay annual and administrative membership fees. The Federation with its funds has made corporate investments in and out of agriculture.

The Federation works in four general areas:

1. General Work
2. Service Work
3. Information and Educational Work and
4. Economic Investigation.

1. The general activity is handled by the Secretariat. Matters relating to foreign trade and international cooperation are handled by a special foreign secretariat. This latter office maintains contact with foreign organizations, handles questions relating to international cooperation and arranges exports of breeding stock. It is the one that arranged our schedule while we were in Sweden.

2. The Service Activity is very extensive and includes help to societies and farmers on bookkeeping, farm management, taxation problems, legal matters and office organization. It issues quotations for agricultural produce and publishes market surveys.

3. Information and education are important features of the Federation's activity. It arranges courses in the provinces with a special lecture section. The Federation's publishing Company (owned with the major national organizations) publishes numerous books, journals and a weekly cooperative farm journal which has a circulation of 370,000 which reaches practically all of Sweden's farmers.

The cooperatives have a school of their own and a correspondence school.

4. The Institute for Agricultural Investigation was established in 1950 by the Federation and Farmers Union for research in economics and social problems of Agriculture. The results are published in journals and reports.

The Swedish Farmers Meat Marketing Organization
(Sveriges Slakteriforbund)

The Meat Marketing Organization (SS) was established in 1933. At present the National Organization is made up of 25 Provincial Slaughtering Coops that have 280,000 farmer members. The organization controls about 80% of the total slaughter in Sweden. The Consumer Cooperative controls about 13% and Private about 7%. So Cooperatives dominate the slaughter in Sweden.

Sweden has been divided by the National Organization into 27 districts. Twenty-five of the districts are made up by the 25 provincial slaughtering cooperatives. The other two are the large cities of

Stockholm and Gothenberg which belong to the National Organization. Each cooperative has exclusive rights in its territory both for procurement and for distribution of products to consumers or retailers in its area. This leaves the two large cities for the National Organization for distribution. Each cooperative must sell its surplus to the National and any deficit must also be brought through the National organization. The National also has control of all exports and imports. There are a few exceptions on distribution of canned goods.

Some of the provincial cooperatives have more than one slaughtering plant and many also have canning and sausage factories, chilling and freezing rooms, rendering plants and feed manufacturing plants so that they process practically all the carcass into saleable products.

The collecting and transportation of pigs and other stock from the farmer-members to the slaughter houses are organized and paid for by the provincial cooperatives. Some have their own trucks, but others contract with haulers.

Every member must sell all his livestock for slaughter to the cooperatives in its district as long as he is a member even for life. The farmer can withdraw membership and get his investment back, but he cannot sell to another farmer cooperative slaughtering plant as each plant has exclusive rights to the district.

By a Government Act all meat and bacon must be graded. At every slaughter house there is one or more persons authorized to do the grading. All payments to farmers are based on slaughter weight and grade after killing. Some of the pork grading is done with a probe at one spot in the back on carcasses not going for English Bacon. From the return to the

farmer about 2 percent (varies with coops) is deducted for share capital of the cooperatives. This can be gotten by the farmer when he withdraws his membership or retires from farming.

Each week (Friday) the Meat Marketing Associations establishes a price it will pay for meat in Stockholm. Then each Cooperative establishes its own price within its area. Farmers know each Saturday the price for next week. The marketing organization with the Government can vary the import fees so that farmers receive a fair return. Also the Government sets the average return that farmers must receive for pigs.

Some work has been done by the Association to shift consumption by pricing meats at different levels and some by advertising.

"SCAN"

A visit was made to a slaughtering plant and a canning plant of Scan. This cooperative operates five slaughtering plants as well as a canning and sausage plant and rendering plant and is the largest of the Cooperatives. This plant was killing 100-110 hogs per hour with 20 men on the kill line before the cooler. They were paying \$45.00 per week for 48 hours of labor, base pay. This was more than in Denmark, but the money would not buy as much.

Scan did 80-90% of the meat business in its district. They did not have salesmen to the retail stores. Everything was sold over the telephone. They felt with that proportion of the business and all meat graded that salesmen would be an added expense.

Their canning plant was one of the most efficient seen. They were using one automatic weiner skinning machine, but labor on other lines to

do the peeling. They said labor was cheaper, but would like to get other machines, but were so expensive.

The scales were operated by Scan. Farmers had maintained a man for inspection, but gave it up as an expense. The scales are set at 4% shrink to take care of chill.

Scan operates on a 1 member 1 vote principal and returns the savings less retains to members. Scan invests members funds in various companies (Hotel).

Pigs in Netherlands

Organization

3,000 breeders in Provincial Herdbook Societies. Inspectors of Societies judge breeding stock on conformation. Only sows and boars are entered in Herdbook which are of pedigree descent and comply with minimum standards as to conformation, development, size of litters, number of teats, etc.

The Provincial Herdbook Societies have joined the Netherlands Pig Breeders Association to develop uniformity in breeding policies and assist in exporting breeding stock.

4 million pigs produced annually in Holland by 160,000 farmers, 1/6 for bacon and 5/6 for domestic market.

Litter Testing Stations

The Herdbook Societies supervise litter testing stations.

First station started in 1930 and at present 10 are in operation. 3,000 pigs are tested annually. The two breeds are Dutch Large White and Dutch Landrace. 70% of pigs produced are Landrace and 30% Large White. Any breeder of pedigree pigs allow to enter 4 pigs of a litter in

station provided they meet specific standards. The inspector of the pig herdbook society has to decide which litters will be tested. He selects the pigs to be tested. (2 of each sex).

Landrace pigs finish test at 198# and Large Whites at 275#.

Test pigs are all fed and managed the same at all testing stations.

Pigs are scored at slaughter as to quality.

If group tested per litter score satisfactorily as to carcass quality and made satisfactory rate of gain and feed utilization, and dam is a Star Sow. The boars producing qualified tested litters are known as known as/Premium Boars. Several litters sired by a given boar and satisfactorily tested are judged on conformation. Sire is known as Elite.

90% of boars used in Holland are tested.

Feeding Station Conditions

1. Pigs started on test at 48#.
2. Up to weight of 110# pigs are fed a grain mixture plus skim milk.
3. From 110# to end of test no milk is fed.
4. Temperature in buildings controlled.
5. All pigs from a station are slaughtered at same plant. Carcasses scored by same inspector. Various cuts of carcasses are scored.

Slaughter Quality

Dutch Landrace

1. Carcass length - first rib to aitch bone.
2. Fat back thickness measured at 4 places (shoulder, 2 on back and 1 at the loin).
3. Carcasses are graded according to back fat into three grades of I, II and III.

Thickness of Fat

Grade I - Not more than 1.2" fat at the ham, 1.2" at the mid back, 2.0" fat at the shoulder.

Grade II - Not more than 1.4" fat at the ham, 1.4" at the mid back and 2.2" fat at the shoulder.

Grade III - Not more than 1.6" fat at the ham, 1.6" at the mid back and 2.4" fat at the shoulder.

These standards are for a carcass weight of 76 Kilos or less (167.6#).

Over 76 Kilos the fat back standards increase .1". Carcasses with less than .6" are rejected for bacon curing.

Type within grade is scored A, B and C (conformation or proportion of forehand, middle and ham. Most desirable is light forehand, a long and well fleshed back and loin and a well developed ham.

On the basis of type the following lists the various grades: IA, IB, IC, IIA, IIB, IIC and IIA, IIB, IIIC. CC irregular and grade IV more fat than grade III.

Highest class of payment - IA, IIA

Second class of payment -IIIA, IB, IIB

Third class of payment -IIIB, IC, IIC and IIIC

CC and IV are excluded from quality payment. Factories can pay for these pigs at their will and are not eligible for bacon curing.

Difference in payment between classes amounts to 5 cents (Netherland Money) per Kg. (2.2#) the maximum price difference thus being 10 cents per Kg. (4 cents Netherland money equals

1 U. S. cent).

In most cases the farmer receives with his payment information as to grade and class of payment. Sometimes a statement as to score such as heavy shoulder or relatively short.

4. Scoring by sight of heaviness of shoulder and length of ribs, shape and development of ham, thickness of skin, thickness of bones and quality of meat.
5. The string of cutlets (back muscle) and hams are cut out and weighed.

Dutch Large Whites

1. Carcasses measured same as Landrace.
2. Carcasses cut up and weights determined for the various cuts.
3. Weight of hams, string of cutlets, shoulders and lean trimmings determine the amount of meat.
4. Fat is determined by weight of fat back, belly and fat trimmings.
5. Weight of head, legs and tails is considered offal.
6. Final score is determined by ratio of meat and fat, the length, the shape of hams and quality of meat.

Results

Landrace

Approximately 50% of Landrace pigs tested in 1930 were Class I. Today the percent of Class I is better than 90%. Carcass length increased from 30.33" in 1930 to 31.91" today.

Large Whites

Approximately 18% of carcass weight was hams in 1935 and today this percent is over 22%. The percent of lean in the carcass increased

from approximately 46% in 1930 to 56% today. The percent of fat in the carcass decreased from approximately 46% in 1930 to 36% today.

This improvement in breeding stock has improved the commercial pig crop of Holland. A system of payment on a slaughter-quality basis has been developed with the net result of a more profitable pig industry.

The Marketing of Hogs in the Netherlands

The marketing of hogs in the Netherlands is different from Denmark and Sweden. In both Denmark and Sweden hogs were delivered and contracted to the local plant or Cooperative. In the Netherlands, the 40 largest private slaughterers have set up a buying organization that buys all hogs from the farmers for the private plants. This organization pays the same price for all hogs at the farm and then allocates them to the different plants on the basis of capacity or requests. This organization as a commission firm deducts $1\frac{1}{2}$ percent to pay for hauling and other administrative expenses. The plants pay the organization and the organization pays the farmers. The farmers must sign that they will sell to the plant.

Very similar to the above, with the exception of Cooperatives in two provinces, the Cooperative slaughtering plants have joined together in one organization that pays the same prices to all farmers for hogs of the same quality and weight. The Cooperative organizations set the price on Friday or Saturday for the following week. In this case however, the farmer must notify the Cooperative by Wednesday that he plans to send in hogs the following week. The members of the Cooperative must sell all his hogs to the Cooperative.

All the large slaughtering plants pay on the basis of weight (dead) and grade. The scales in private plants are operated by a government man, with a plant man and a farmer representative to watch the weighing. At Cooperative plants the farmer representative no longer stays at the scales. The grading is done by a government grader.

Up until October 1, 1956 the government did all exporting of "bacon". Since then the trading has been done directly by the firms. The Government still supports the price of "bacon" pigs but a definite plan has not been agreed upon. At present there is no restriction on production. The supporting is done by a board with funds from the ministry and money collected when prices are high. The support price is based on a cost study of 1,800 farms made by the Institute plus about 4 cents for profit.

The Cooperatives slaughter about $\frac{1}{2}$ of the "bacon" pigs but only about 25% of the total hogs slaughtered. The large Cooperative has central control but has a provincial organization for procurement of hogs. The Cooperatives get some hogs for bacon and sell them to the private slaughterers. There appeared to be no real fight between Cooperatives and non-Cooperatives but neither did there appear any collusion.

Packing Plants Visited

Visits were made to the two packing plants at Oss. These were supposed to be the largest and best in the Netherlands. Each of them kill from 3-400,000 hogs per year.

The wage scale was \$24.00 (90 Guilders) per week for basic work with extra pay for different jobs and also for additional knowledge of other jobs. That is, if a person knew several jobs, he would be given extra

pay for his knowledge. Most jobs were also rated. A man may make up to 1/3 more as a premium. Any over the 1/3 went into a social fund to be used to help workers in time of need - a nurse for wife, assist widow or for study. Workers also retire at 65 at about 80 % of salary.

Workers may start work at 15 years of age. We saw several young and small workers. A boy may even start at 14 years if he will attend the Company's school and learn the trade. Only unmarried women were employed and then only in the packaging department.

The plants exported a large proportion of the products processed (one 60%). Both employed salesmen who called on retailers. One used only rail for delivery while the other also used trucks.

The Hog Industry in France

France is second largest pork producer in Europe with a production of hogs in 1956 valued at about \$800 million. The country is about 100% self-sufficient; exports usually slightly exceed imports. Pork accounts for about 41% of the total meat consumption (exclusive of poultry and rabbits) while beef and veal supply 51% and other animals 8%. Per capita consumption of pork in France is about 53 pounds per year compared with about 60 pounds in the U.S. The following shows the relative importance of the production of the various kinds of red meat.

<u>Kind</u>	<u>1955</u> 1,000 metric tons	<u>1956</u> metric tons
Pork.....	950	1,070
Beef and Veal.....	1,390	1,335
Mutton and Lamb.....	115	115
Horse.....	<u>90</u>	<u>90</u>
Total	2,545	2,610

The number of hogs on farms in 1955 and 1956 were at a record level of over 7.7 million head. The number, however, has not increased sharply over a long period of time. In 1956 the number was only 15% greater than in 1900, and only 8% above the prewar level. During the war, of course, the number declined sharply to only 3.6 million in 1943, but has increased steadily since then. The following shows the number of hogs on farms and the estimated pork production in France.

<u>Year</u>	<u>Total Number of Hogs on Farms October 1</u> Number	<u>Total Pork Estimated Production</u> Metric Tons
1937 prewar	7,126,720	676,000
1946 war year	3,656,000	not available
1950	6,824,000	820,000
1955	7,729,200	950,000
1956	7,728,000	1,070,000

The greatest increase in production apparently has not been from more hogs on farms, but rather from the increased output of pork resulting from more efficient feeding and other practices and more efficient types of hogs. No accurate records are available as to the weight of pork that was produced many years ago, but official estimates indicate a 40% increase in pork production between 1937 and 1955 and a 58% increase by 1956, whereas the number of hogs on farms increased by only 8% during that period. The average weight of all hogs slaughtered under inspection, however, has not changed appreciably from an average of about 240 pounds per head before the war. This is about the same weight as the average of hogs slaughtered in the U.S. where a somewhat fatter carcass is acceptable. This average figure includes many older breeding animals; the average weight of the good slaughter hogs is between 220 and 240 pounds.

The tendency in France is toward marketing at lighter weights with preference for hogs of about 200 pounds live weight. These bring the

top price because they produce the lean meat desired by French consumers. Some heavier hogs, however, are still sold by farmers who have not yet made the adjustment toward lighter weights. The breakdown of the number of hogs on farms as of October 1, 1956 was as follows:

<u>Kinds</u>	<u>Hogs on Farms on Oct. 1, 1956 Number</u>
Boars.	43,000
Sows	936,000
Hogs under 6 months.	2,472,000
Hogs over 6 months	4,277,000
Total.	<u>7,728,000</u>

This shows that on October 1, 1956 about 32% of all hogs were under 6 months old and only 55% were over 6 months, plus 13% of breeding stock. This very high percentage of 68% over 6 months old indicates that most hogs are not marketed until well over 6 months of age as a result of relatively less intensive feeding practices. On January 1, in the U. S. only 33% of all the hogs were over 6 months old.

Methods and Feeds

Hog production in France is widely spread. Most farmers regularly keep a few hogs primarily for their own use. Estimates of the Ministry of Agriculture indicate that slightly over 40% of the hogs produced are consumed in or near the farms and not marketed commercially.

In general the commercial hog production tends to center near the regions that have the special feed supplies including:

1. Starch producing areas:

Potatoes in Brittany, Limousin and Alsace,

Jerusalem artichokes in Charente, Poitou and Limousin.

2. Corn producing areas:

In South-Western France.

3. Milk Producing areas:

Where skim milk and or whey are available for feed as by-products from the production of butter and cheese, especially in Charente, Normandy and Cantal.

4. Regions around largest cities and harbours:

Where by-products and wastes from various industries are available such as from milling industries and slaughter houses.

The principal feed for hogs, however, is usually barley and oats supplemented, according to regions, by potatoes, corn, Jerusalem artichokes and beets. Commercial feed used for hogs in 1956 amounted to about 500,000 metric tons.

By far the most important breed of hogs in France is the Large White Yorkshire but other important breeds include Danish Bayeux, Blanche de l'Ouest, Amelioree de l'Est, Craonnaise, Normande, Flamande, Gasconne, Limousine, Mielan, Pie-Noire du Pays-Basque. Emphasis is placed on the meat-type breeds rather than lard or bacon types.

Prices

Prices of live hogs average the equivalent of about 26 cents a pound, varying from 24 cents for second quality to 30 cents for extra quality. At the same time prices for beef cattle usually vary from 20 to 26 cents a pound. Wholesale prices of carcass sides average a little over 40 cents a pound. The retail prices for pork roast usually is equivalent to about 65 to 75 cents a pound, but ham sells at nearly \$1.25 a pound while beef retails from 35 cents a pound for stew meat to \$1.10 a pound for steak.

The Government supports hog prices as an "intervention" price level of 188 to 199 francs per kilo live weight (24.4 to 25.3 cents per pound).

When the price on the Paris market falls below this level the Government agency SIBEV purchases pork, freezes it and stores it for either later domestic consumption or export until the price of live hogs rises to the intervention level.

All sales of all meat at the first wholesale level have been taxed 56.5 francs per kilo carcass weight (7.3 cents per pound). In April 1957, however, this tax was reduced on pork to 26 francs per kilo (3.4 cents a pound). Most of this tax is paid into the National Treasury but a small part 5.5% of the receipts are deposited in the Meat Stabilization Fund which is responsible for making the stabilization purchases when the price falls below intervention level. The funds are used to defray the loss on such purchases including subsidies on the meat exported. The 56.5 francs tax is an important item in increasing the retail price of meat in France because in the case of pork it was equivalent to nearly 20% of the price of the carcass. At the present reduced rate on pork it is equivalent to 8.5% of the wholesale price. Parts of the receipts from the tax also are used for animal disease eradication and for the milk stabilization fund.

Foreign Trade

Imports and exports of hogs and pork are relatively small. Less than 100 hogs a year usually are imported or exported for breeding purposes while imports and exports of hogs for slaughter usually vary from 1,000 hogs to 20,000 heads or roughly 1/10 of 1% of the total number of head produced in France. Imports in 1955 were exceptionally large at 193,000 head mostly pigs from Germany for feeding in France.

Year	Hogs on Farms October 1	Foreign Trade in Live Hogs	
		Imports	Exports
	1, 0 0 0	Hea d	
1953	7,179	0.2	2.
1954	7,328	17.	3.
1955	7,729	193.	7.
1956	7,728	1.	18.

Imports of fresh or frozen pork amount to only 1% to 3% of the consumption while exports usually are less than 1%. In addition, however, France imports considerable quantities of liver and offal, equivalent to about 1% of the total pork consumption. Imports of liver have increased steadily to 4,237 metric tons in 1956 (largely from the U.S.) used to make liver pates. Considerable quantities of cured or canned pork, 7,061 tons in 1956 and of unidentified meat, 12,239 tons, were exported, but we do not know what portion of these products consist of pork. The following table shows the imports and exports of pork meat and products, both pork products and products that may contain pork.

Table - Imports and Exports of Pork and Meat Products that may contain pork, 1953 - 1956

IMPORTS							
Year	Pork			:	Products Partly Pork		
	Fresh or	Cured	Canned		Liver	Other	Curred or
	frozen				1/	Offal	Canned
	Metric tons				Metric tons		
1953	: 1,662	: 59	: 76	:	2,770	: 3,993	: 3,395
1954	: 16,051	: 21	: 219	:	2,647	: 3,731	: 1,502
1955	: 28,395	: 121	: 116	:	3,183	: 5,125	: 1,992
1956	: 5,284	: 311	: 112	:	4,237	: 313	: 1,458
EXPORTS							
1953	: 345	: 1,326	: 4,110	:	890	: 961	: 7,945
1954	: 5,075	: 956	: 3,944	:	1,399 ^{2/}	: 1,490	: 11,518
1955	: 2,434	: 1,025	: 4,979	:	1,375	: 850	: 13,210
1956	: 5,506	: 1,357	: 5,704	:	1,457	: 1,472	: 12,239

Source: Compiled from Official Foreign Trade Statistics

^{1/} Exclusive of poultry livers

^{2/} Exports of liver were largely canned products

The French Government is tightening its import controls to reduce the adverse balance of trade. The reserves of dollars and other hard currencies have declined steadily for a year and a half to a critically low level. All imports require import permits which are being held to a minimum, and preference is given to imports from countries in the French franc area and to countries with which France had bilateral trade agreements that assure a market for an equal value of french exports. The imports of pork livers from the U. S. in recent years have mostly been arranged through private compensation arrangements which are a kind of barter.

Lard

France is not a large producer or consumer of lard. Total production was estimated at 65,114 metric tons in 1955 and 75,660 tons in 1956, but less than half of this was commercially produced. More than half was produced and consumed on or near the farm. France imports practically no lard but exports have increased sharply to 19,501 metric tons in 1956 equal to 5.5% of the commercial production. Consumption of lard, commercial and other, is estimated at about 55,000 metric tons or only about 2.7 pounds per capita compared with 12 pounds per capita in the U. S. For cooking fats, France relies heavily on butter and vegetable oils.

Farm Organizations

The main association of hog producers in France is "Federation Nationale des Producteurs de Pore" whose President is Marc Ferre with offices at 7, Rue Scribe, Paris. This association has branches throughout the country and represents the interests of French hog producers including dealing with other agricultural associations and with Government officials. In addition, the various breeds maintain herd book registration.

Government Policy and Outlook

In general the Government policy with respect to pork production may be summarized as (1) to maintain stable prices to producers and consumers and (2) to encourage increased production and exports. Price stability is accomplished by means of the support price and Government purchases already described. The Third Modernization Plan now awaiting final approval by the Government, stresses the objective of increasing livestock production and exports of livestock products as part of a shift from grain to livestock products and in an effort to increase the country's foreign exchange receipts. The Modernization Plan states that pork production is to be increased by 22% from 900,000 metric tons in 1954 to 1,100,000 tons by 1961. Since the plan was originally formulated, however, pork production rose sharply to 1,070,000 in 1956 or to nearly the 1961 goal, so that much further expansion during the next four years is not called for in the plan. The plan anticipates an increase in domestic consumption of pork by 18% from 888,000 tons in 1954 to 1,048,000 tons in 1961. Exports, however, also are to be increased from about 9,000 tons in 1954 to 50,000 tons by 1961 and 60,000 tons by 1965. This amount would be equivalent to only about 5% of the total pork production. One important problem will be to get farmers to adjust to the type of carcass that more nearly meets the market demand for a lean meat-type of carcass.

France has a total of 1,565 meat slaughtering plants of which only five are large pork plants.

The above information on France's hog industry was assembled through the office of : Paul G. Minneman, Agricultural Attache, American Embassy, Paris.

The British Pig Industry

Size of Pig Population

The last agricultural census (March 1957) gave the number of pigs in England and Wales as 4,631,000. In Scotland the pig population is 467,868, and that of Northern Ireland 640,900. This gives a total for the United Kingdom of 5,739,768. Compared with 1954, this shows a drop of 511,232.

Number of Pig Enterprises

Full information is not available about the number of pig enterprises in the United Kingdom, but it is certainly considerably over a quarter of a million. Reliable estimates put the number of holdings of over one acre, on which pigs are kept, at 230,000. In addition there are considerable numbers of pigs kept on plots of land of less than one acre. A recent survey shows that there are 78,000 of such holdings. It can be accepted, therefore, that there are just over 300,000 pig-farming units in the UK.

Types of Enterprises

There are four main types of pig enterprises:

- (1) Pedigree breeding herds whose main enterprise is the sale of gilts and boars for breeding.
- (2) Commercial breeding herds whose main enterprise is the sale of weaners or young store pigs; in these herds pigs are not normally fattened for sale.
- (3) The feeding of weaners or young store pigs on farms which carry no breeding herd; all pigs are "bought-in".
- (4) Breeding and feeding carried out on the same farm.

Number of Pedigree Herds

There are about 14,000 members of Breed Societies in the United Kingdom (as compared with over 150,000 people with breeding stock).

In all, there are sixteen different breeds of pigs. The main breeds (with numbers of stock registered in Herd Books, 1956) are:

Large White	25,850
Landrace.	13,045
Wessex Saddleback	3,037
Essex	1,796
Welsh	1,380
Large Black	934
Middle White.	138
Berkshire	230
Tamworth.	166
Gloucester Old Spot . . .	268

The minor breeds are Long White Lop Eared, Cumberland, Yorkshire Blue and White, Dorset Gold Tip, Lincolnshire Curly Coat and Oxford Sandy and Black.

Progeny Testing and Pig Recording

Progeny testing of boars started in this country in 1953, when the National Pig Breeders' Association set up a "pilot" scheme. Unofficial testing of boars, and sows and litters, has been conducted by a feeding-stuffs firm, British Oil and Cake Mills, since 1949. Five progeny testing stations are now being built under Ministry of Agriculture supervision, and the first should be operating this year (1957).

Taking the two main bacon breeds - the Large White and Landrace - here are some of the average test figures over three years (1954-1956):

	<u>L. White</u>	<u>Landrace</u>
Age to slaughter (days)	196	193
Food conversion rate	3.51	3.54
Killing-out percentage	72	71.8

	<u>L. White</u>	<u>Landrace</u>
Backfat thickness (mm):		
Shoulder	49	43
Mid Back	23	23
Mid Loin	29	27
Length (mm): Atlas (from pubic bone to atlas joint side laying flat)	946	962
Grading	76% A (over 258 groups)	95% A (over 28 groups)

The recording of pigs is carried out under the Ministry of Agriculture's national Pig Records in England and Wales. At the end of April, 1957, there were 2,710 members owning a total of 39,989 sows. Under this scheme all births are notified and the litters weighed at three weeks (optional) and eight weeks. Pig Recording Officers visit farms to carry out check weighing from time to time and to give advice generally to members. A charge of 5s per litter is made.

If members so desire, reports on the grading of recorded pigs are made available so that the performance of a sow as a bacon-pig producer can be assessed.

Here are the national summaries, 1954-55:

Period	Av. No. Born Alive	Av. No. Reared to 8 Weeks	Av. Weight per pig (lb.)	Av. Weight per litter (lb.)
Winter	10.3	8.0	32.5	259
Summer	10.4	8.5	34.3	292

A national pig recording scheme has recently been introduced in Scotland.

Marketing of Pigs and Pigmeat

There are over 200 establishments where bacon is produced, but only 100 have a capacity of more than 12½ tons per week.

Since July, 1954, the great majority of the bacon factories in Great Britain have purchased pigs from the Fatstock Marketing Corporation, a company established by the National Farmers' Unions to trade in fat stock primarily on the basis of grade and deadweight. The pigs are purchased by the factories on the basis of a contract under which the prices they pay are related to the price realized for English bacon.

The Fatstock Marketing Corporation buys pigs from farmers on the basis of price schedules for the various weights and grades of pig which include the price guarantee payments which the Corporation secures from the Government. The prices offered by the Corporation have not been necessarily the sum of the payments by the curers and the guarantee payments for particular classes of pig.

The Corporation have maintained larger differentials between the various grades of pig than they themselves secured, for much of the period since July, 1954. This was done in order to encourage a rapid improvement in the quality of the bacon pigs coming forward and to discourage the supply of pigs outside the weight range suitable for curing to bacon factories (140 to 175 lb. deadweight). In addition, the Corporation fixed its general price level after considering the ruling prices for pork pigs. This meant that at certain times it paid to farmers less than it had secured from the curers and the guarantee payments; and at other times it paid higher prices than it was securing currently from both the sale of pigs and the guarantee payments.

The current price (June 10th) ruling for a top grade (Triple A) bacon pig with a carcass length of 31.52 inches and over is \$7.56 per score (20 lb.) deadweight. Taking a bacon pig of 8 score (160 lb.)

that makes top grade, then the return to the farmer would be 121 12s (\$58.94).

One University survey shows that in the year ending in September, 1955, pigmeat cost about \$6.30 per score (20 lb.) to produce. This was the result of an investigation on 46 progressive farms and does not take into account a return for capital or remuneration for management. Applying this figure to an 8-score pig the production cost would be 118.

Of the four million pigs that go to the bacon factories each year, over three million of them are handled by the Fatstock Marketing Corporation. As it also buys pork pigs (about 650,000 a year), the Corporation deals with 47 percent of the total pigs marketed in the UK (1955 situation).

Of the pigs not sold to the bacon factories 37 percent are sold through the 550 fatstock auction markets. Some of these markets are very large, handling many hundreds of pigs on each market day, all on a liveweight basis.

The remaining 16 percent of the pigs marketed are, in the main, brought privately from the farmer.

In 1955 six million pigs were sold in the fresh pork market and to the manufacturing trade (for sausages, pork pies, processed meat, etc.).

Consumption of pork is substantially higher than before the war. Separate estimates are not available for fresh and manufactured pork before the war, but the combined total in 1955 was 50 percent higher than pre-war.

Consumption of pigmeat in manufactured form has been estimated at over 200,000 tons a year - or roughly the same as fresh pork.

The output of pigmeat from British farms in 1954-55 was valued at

L185 million.

The 1955 total consumption of bacon and ham (552,000 tons, of which 363,000 tons were imported) was rather less than before the war, both in total and per head of the population. The general opinion is that it will be very difficult to expand consumption significantly.

Great Britain imports pigmeat both as pork and as bacon - but bacon imports predominate. For the year 1954-56 imports of bacon have been running at around 300,000 tons per annum, rather more than half the total supplies. Denmark is the biggest single supplier of bacon (over 70 percent of all the bacon imported).

The importing of pigmeat is in the hands of private traders, and there is a 10 percent ad valorem duty on all imports other than from the Commonwealth and Irish Republic.

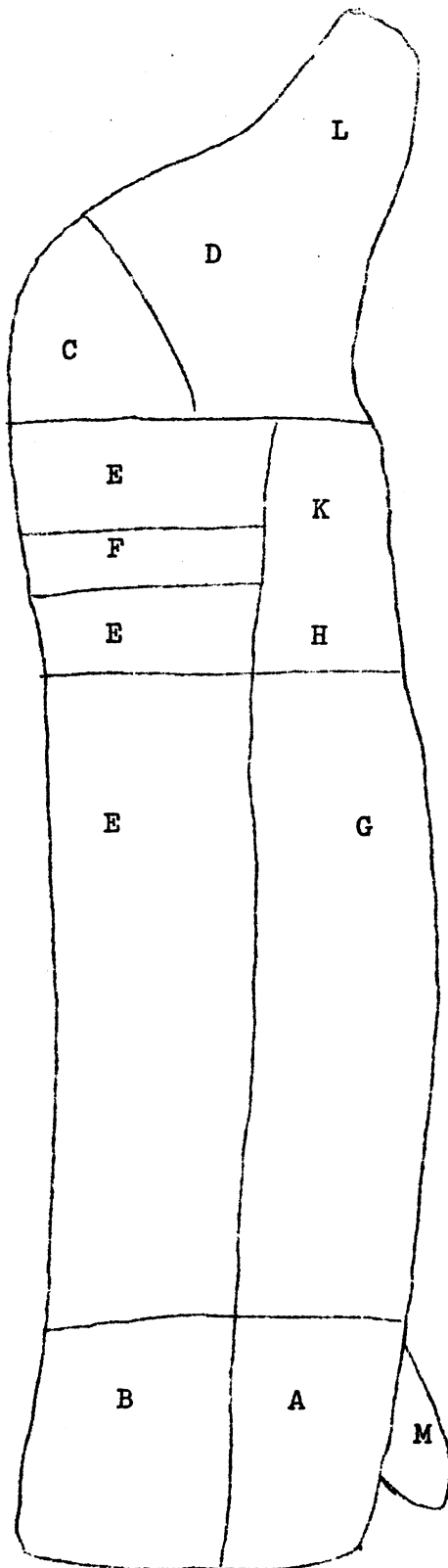
This information on British Pig Industry supplied by: P. G. Wood, Associate Director, Pig Farming, Pig Publications Ltd.

Meat Merchandising

Great Britain consumes about 10,000 tons of "bacon" (whole side) per week. About 4,000 tons are produced domestically, 5,000 tons imported each week from Denmark and the balance from the Netherlands, Sweden and other countries. The demand for bacon is relatively inelastic so that supply affects the price very much. "Bacon" consumption is about 25 pounds per person while other pork is about 19 pounds. Almost all other pork is domestically produced.

"Bacon" pigs and hogs other than for "bacon" are marketed and handled differently. Although the pigs could be used at different weights for pork or "bacon" they are really two products.

Side of Bacon



CUT

- A - Forehock
- B - Collar
- C - Corner Cut
- D - Gammon Middle
- E - Back (Prime)
- F - Osyter Rashers
- G - Prime Streak
- H - Thin Streak
- K - Flank
- L - Gammon Knuckle
- M - Fore Knuckle

About 85% of the bacon pigs are marketed through the Fatstock Marketing Corporation that was established in 1954 by the Farmers Union. This Corporation acting as a cooperative has contracts with 85% of the "Bacon" factories for supply. The Fatstock Marketing Corporation has a local supply officer located in each production area (county). Farmers may buy a life membership in the Marketing Corporation for about 75 cents. Any farmer may sell through the Marketing Corporation but only members share in earnings. Slightly less than a \$1.00 (6s6d) is charged per pig to cover all transportation and marketing costs. A farmer desiring to sell "bacon" pigs must notify the local supply officer at least 10 days before the marketing week. On the basis of listings the Marketing Corporation allocates the number to each of the bacon factories on the basis of capacity. The "bacon" factories have excess capacity and are now operating at about 50% capacity. On Thursday of each week the Marketing Corporation announces the price for "bacon" pigs for the following week. This is based on a formula taking price of "bacon" and by-products into consideration. The price of pigs are supported by the government on the basis of an average price for the year. The Fatstock Marketing Corporation may announce less than formula and subsidy in order to discourage the production or may announce a price higher in order to encourage production of "bacon". The difference is added or taken out of a stabilization fund. Farmers are paid by the Fatstock Corporation. All are sold on basis of carcass weight and grade.

Most of the pigs going for pork (not "bacon") that are lighter or heavier than the bacon pigs go through auction. Here they are weighed on arrival so that fill is encouraged and are sold on live weight.

The Fatstock Marketing Corporation does no "bacon" curing but either owns or rents 120 slaughter houses for pork, beef, sheep and lamb. They also control about 1/3 of the by-products industry in Great Britain. During a week they will slaughter and process from 7-10,000 cattle, 25-60,000 sheep and lambs and about 20,000 pigs. For "bacon" they will market from 45,000-60,000 bacon pigs. They sell all "pork", beef, mutton and lamb to retail stores - they have no retail outlets. Last year the profit in Fatstock was over 3 million dollars and returned to members over \$500,000, (1200,000). They have 80,000 members.

A visit was made to the Smithfield Market. Here it was stated that 90% of the meat for London passes through that market. Both domestic and imported carcasses are hung unrefrigerated on rails in the market. The 96 commission firms sell by private treaty to retailers and distributors according to their wishes. Carcasses are cut as portions are sold. Transportation of products in the market is almost entirely by manually operated carts. It appears to a visitor to be very inefficient and a very poor way to display and handle meat.

Conferences were held with owners of multiple retail stores and with the Independent Retail Organization for comments on imported bacon particularly. Both mentioned the presence of some carcasses meeting the fat standard but then not having a good loin eye - slight of lean. They also mentioned carcasses being too heavy. The regulation for domestic bacon is expected to drop to 165 lbs. top limit about September 1.

The pricing of Danish bacon in Great Britain was of interest since Denmark supplies 50 percent of the bacon consumed in the Country. "Bacon" arriving from Denmark is distributed each week by the Agents without a

price being set until Thursday. Then a board made up of the Danish Agents, Wholesalers and multiple shop (chain store) owners discuss the situation. Then the Danish Agents set a price that covers all "bacon" for the entire week. One company complained about the rigidity of a price for a week but others favored it to bargaining on each purchase.

Bacon sides are sometimes cut by the wholesalers before going to the retail store. They are usually cut into 3 pieces for one area (fore-middle-ham) and 4 for another (middle cut into loin and streak). One firm reported cutting 60 percent of the Bacon sides.

Results

DENMARK

1. No. of pigs raised per litter 1907 - 8.2, 1956 - 9.4
2. Rate of gain increased 20% during 50 years.
3. Feed conversion rate declined 20% in 50 years.
4. Carcass quality improved since 1926.
5. Uniform in fat back and streak measurement.
6. 12% carcasses show pale color
7. 9,000 boars and 8,000 gilts annually sold from breeding centers.
8. In 1938 - 50% of commercial slaughter grade A - today the figure is 70%.

SWEDEN

1. Litter testing required to reg. sow in herd book.
2. Sow must have farrowed at least twice and raised 8 pigs per litter to 3 weeks of age with wt. of 88#.
3. Landrace - 174 days old at 198#. Large Whites 175 days old at 198#.
4. Breeding boars cannot be sold unless from tested litters.

NETHERLANDS

1. In 1932 - 30% pigs slaughtered were No. I, today 70% are No. I.
2. Ham wt. has increased from 18% in 1935 to 22% today of carcass wt.
3. Star Sow - produces qualified litter as to feed, rate of gain and carcass quality.
4. Premium Boar - sire of qualified litter.
5. Elite - breeding animals out of several qualified litters sired by a boar and live judged as to conformation.

ENGLAND

1. Pigs with lighter weaning wt. require more feed per lb. gain up to 210#.
2. Pigs of medium length tend to be younger at 210# and require less feed than short or extremely long pigs.

	<u>DENMARK</u>	<u>SWEDEN</u>	<u>NETHERLANDS</u>	<u>ENGLAND</u>
Testing Station	<ol style="list-style-type: none"> 1. Only pigs tested from breeding centers. 2. 2 gilts & 2 barrows 3. Pigs ind. fed three times a day. 4. Temp. in building controlled. 5. Market value of pigs paid at delivery plus freight. 6. Milk, barley, vitamins & minerals. 7. Pigs started at 44#. Finish at 198#. 	<ol style="list-style-type: none"> 1. Only pigs tested from breeding centers. 2. 2 gilts & 2 barrows. 3. Pigs fed in group. 4. Started in small pens, later moved to large pens. 5. Pens mechanically cleaned. 6. Feed twice a day during week - once on Sunday. 7. Pay 80% value of pigs delivered to station. 8. Temp. controlled. 9. Start 44# Landrace 70 days and Large Whites 73 days old. 10. Finish at 198#. 	<ol style="list-style-type: none"> 1. Started in 1930. 2. 2 gilts & 2 barrows. 3. Fed as a group, 3 times a day. 4. Landrace finish at 198# and Large Whites at 275#. 5. Milk fed up to 110#. 	<p>No visitors allowed. Pigs fed as a group.</p> <ol style="list-style-type: none"> 1. Veterinarian inspection. 2. 2 gilts & 2 barrows. 3. Minimum wt. at 9 wks. 30 lbs. (8# range in group). 4. Breeder paid for all 4 pigs. 5. At least 8 pigs in litter at 8 wks. of age. 6. From registered sire and dam. 7. Pigs vaccinated with crystal violet vaccine 14 days before entering station. 8. Started on test when 1 pig of 4 weighs 70#. 9. Pigs fed for pork will finish at 140#. 10. Pigs fed for bacon will finish at 210#.
Carcass Evaluation	<ol style="list-style-type: none"> 1. Fat back measurement 2. Carcass length measurement. 3. Loin eye measurement last rib since 1954. 4. Score: <ol style="list-style-type: none"> a. Bacon type b. Distribution of fat c. Size of shoulder d. Quality of streak e. Size & shape of ham f. Fineness of head g. Skin & bone h. Color of meat i. Carcass grade 	<ol style="list-style-type: none"> 1. Fat back measurement. 2. Carcass length 3. Thickness of belly. 4. Score: <ol style="list-style-type: none"> a. Firmness of fat b. Distribution of fat c. Shoulders d. Ham development e. Meatiness f. Bacon type g. Carcass grade 	<p><u>Landrace</u></p> <ol style="list-style-type: none"> 1. Fat back measurement 2. Carcass length measurement 3. Loins & hams weighed 4. Score: <ol style="list-style-type: none"> a. Heaviness of shoulder b. Shape of hams c. Quality of meat <p><u>Large White</u></p> <ol style="list-style-type: none"> 1. Same measurements as Landrace 2. All lean cuts weighed 3. All fat cuts weighed 	<ol style="list-style-type: none"> 1. Carcass length measured 2. Thickness of back fat. 3. Thickness of streak. 4. Depth of eye muscle. 5. Score: <ol style="list-style-type: none"> a. Shoulder b. Ham c. Streak d. Distribution of fat e. Firmness of fat f. Proportion of lean to fat g. Fineness of skin and bone

PIG PROGENY TESTING

	<u>DENMARK</u>	<u>SWEDEN</u>	<u>NETHERLANDS</u>	<u>ENGLAND</u>
	All individuals are pigs.			A castrated boar is a hog.
Station ownership	Coop. Bacon Factories	Co. Agr'l. Society	Provincial Herd Book Societies	Government and producers.
No. of Stations	3 (400 pens) 16 small	5	10-3,000 pigs tested yrly. 2,400 Landrace 600 Large Whites	1 now - 5 new stations being built.
Finance	Bacon Factories and Government	Government and Slaughterers	Provincial Herd Book Societies	Government and producers. Producer pays \$14.00 per group.
Supervision	National Research Institute of An. Hub.	Gov. and local Agr'l. Societies and Co. Livestock Adv.	Central Bureau of Pig Breeding	Pig Progeny Testing Board.
Breeds	Landrace (Has some Berk. & L. White blood)	Landrace - 75% Large Whites - 25%	Landrace - 70% Large Whites - 30%	Large Whites Landrace (many breeds) etc.
Breeding Centers	1. (265 Landrace (2 Large White 2. Central Comm. 9 Districts 3. Local District Com. 3 farmers & Agr'l. Adv. visits centers twice a year. Score breeding herd. 4. Vet. inspector checks health. Started in 1895. 5. Sends 4 pigs per litter to testing station. 6. Discards all unsuitable animals (testing and Vet. inspection).	1. 180 Breeding Centers inspected twice a year by Vet. 2. Litter recording since 1923. a. Size of litter b. 3 wks. of age wt. 3. Sends 4 pigs per litter to testing station. 4. Supervised by local Agr'l. Society 5. Maintains at least 3 sows & reg. boar. 6. Vet. Inspection	None	None